

# UNITED STATES PATENT OFFICE.

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## EXPLOSIVE COMPOSITION.

1,329,525.

Specification of Letters Patent.

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No Drawing.

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*To all whom it may concern:*

Be it known that I, WALTER G. HUDSON, of Wilmington, in the county of New Castle, and in the State of Delaware, have invented a certain new and useful Improvement in Explosive Compositions, and do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to explosive compositions and pertains especially to detonating compositions.

The object of my invention is to provide an explosive composition of an advantageous character, which is adapted to be used for detonating or exploding other high explosives, and particularly those which do not ordinarily detonate or explode when merely ignited.

A further object of my invention is to provide a composition of this character which detonates sharply and with great violence when ignited, but which is comparatively insensitive to blows and friction.

A further object is to provide an explosive composition of this character, which is very safe in handling, but which is also based upon the utilization of azids.

A further object of my invention is to provide explosive compositions containing an azid and a colloidal solution of nitrocellulose in nitroglycerin which are commonly known as blasting gelatin or smokeless powder.

A further object is to provide compositions containing azids which are free from the danger previously found in handling the azids, which danger has heretofore rendered them largely incapable of use commercially.

A still further object is to provide detonating compositions containing a blasting gelatin, in which compositions the detonating power of the other ingredients in the compositions has not been impaired by the presence of the blasting gelatin.

Compositions made in accordance with my invention are particularly adapted for obtaining the greatest explosive effect in connection with those compounds which are difficult to thoroughly detonate as, for example, trinitrotoluol, or camphorated blasting gelatin; a class of compounds which ordinarily requires an intermediate charge of some easily detonating material as, for example, tetranitromethylanilin or dry compressed gun cotton. Explosive composi-

tions made in accordance with my invention are in fact as safe to handle as any detonating material and far safer than most of such materials. The effect obtained by the use of compositions made in accordance with my invention is due in part to the highly efficient detonation of the metallic azids, particularly lead and silver azids, but is due in part also to the nature of the admixture which materially adds to the heat and gas volume in the explosive reaction.

While my invention is capable of embodiment in many different forms, for the purpose of illustration I have described only one form of the same hereinafter.

For example, I may prepare a composition of this character by first preparing a blasting gelatin, comprising 93 to 70% of nitroglycerin and 7 to 30% of nitrocellulose and bringing the same into solution by the addition thereto of a quantity of acetone amounting to  $\frac{1}{10}$  to twice the weight of the remaining constituents. If desired, other solvents may be used instead. This blasting gelatin is then mixed with lead azid in the proportions of 90 to 80% lead azid and 10 to 20% blasting gelatin, the solvent being excluded from the calculation as this is to be evaporated off in making the composition. The mixture is thoroughly stirred, and then either allowed to set in molds or is granulated in any desired manner. The solvent can be allowed to evaporate to any consistency suitable to the mode of producing and handling the finished product.

It is to be understood that if desired the proportions in the composition may be very much changed. For example, a detonating composition much softer than the above mentioned composition may be desired. Again, it may be desired to reduce the percentage of blasting gelatin to even 1% or less so as to preserve the physical characteristics of a dry granular powder suitable for pressing into caps or forming into compressed pellets or blocks. In fact, even a very small percentage of the blasting gelatin is sufficient to change the lead azid from a compound dangerous to handle to a safe and effective detonating composition.

Compositions thus produced may have a consistency resembling that of the india-rubber mixtures used for pencil erasers, and have all of the properties hereinabove referred to.

While I have described my invention above in detail, I wish it to be understood that many changes may be made therein without departing from the spirit of my invention.

I claim:

1. A composition containing an azid and a colloided nitrocellulose.
2. A composition containing an azid and a colloidal solution of nitrocellulose in nitroglycerin.
3. A composition containing a lead azid and a colloided nitrocellulose.
4. A composition containing a lead azid and a colloidal solution of nitrocellulose in nitroglycerin.
5. A composition containing an azid and at least 1% of a colloided nitrocellulose.
6. A composition containing an azid and at least 1% of a colloidal solution of nitrocellulose in nitroglycerin.
7. A composition containing a lead azid and at least 1% of a colloided nitrocellulose.
8. A composition containing a lead azid and at least 1% of a colloidal solution of nitrocellulose in nitroglycerin.
9. A composition containing an azid and at least 10% of a colloided nitrocellulose.
10. A composition containing an azid and at least 10% of a colloidal solution of nitrocellulose in nitroglycerin.
11. A composition containing an azid, a colloided nitrocellulose and a volatile solvent.
12. A composition containing an azid, a

colloidal solution of nitrocellulose in nitroglycerin, and a volatile solvent.

13. A composition containing a lead azid, a colloided nitrocellulose, and a volatile solvent.

14. A composition containing a lead azid, a colloidal solution of nitrocellulose in nitroglycerin and a volatile solvent.

15. A composition containing an azid, at least 1% of a colloided nitrocellulose, and a volatile solvent.

16. A composition containing an azid, at least 1% of a colloidal solution of nitrocellulose in nitroglycerin, and a volatile solvent.

17. A composition containing an azid, at least 10% of a colloided nitrocellulose, and a volatile solvent.

18. A composition containing an azid, at least 10% of a colloidal solution of nitrocellulose in nitroglycerin, and a volatile solvent.

19. A composition containing a lead azid, at least 10% of a colloided nitrocellulose, and a volatile solvent.

20. A composition containing a lead azid, at least 10% of a colloidal solution of nitrocellulose in nitroglycerin, and a volatile solvent.

In testimony that I claim the foregoing I have hereunto set my hand.

WALTER G. HUDSON.

Witnesses:

ALFRED K. SMITH,  
M. E. DORSEY.